GaAs SPDT Switch
17.7 - 31.0 GHz

MASW-011105

Rev. V3

Features

- Broadband Performance
- Low Insertion Loss: 1.6 dB
- High Isolation: 30 dB
- Fast Switching Speed: 12 ns
- Reflective Configuration
- Ultra Low DC Power Consumption
- Lead-Free 3 mm 14-Lead PQFN Package
- RoHS* Compliant

Applications

- Test & Measurement

Description

The MASW-011105 is a versatile, broadband, high isolation SPDT switch offered in a lead-free 3 mm 14-lead PQFN surface mount plastic package. The combination of broadband performance along with fast switching and excellent settling time make this device ideal for many applications, including test & measurement, EW and broadband communication systems.

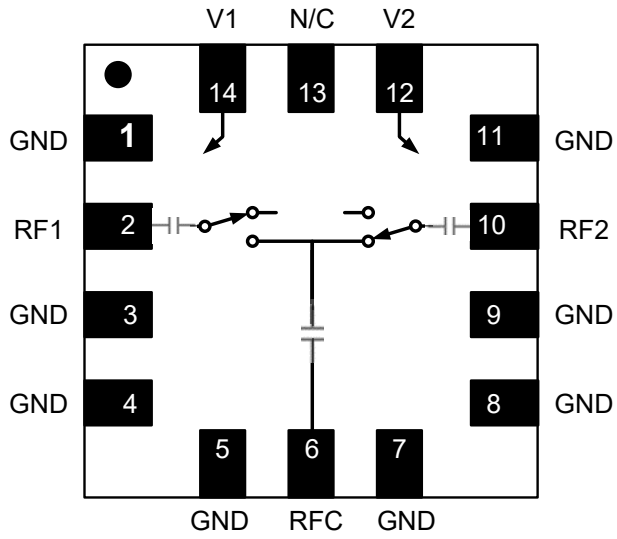
The MASW-011105 is fabricated using MACOM's robust process with full surface passivation for a high performance and high reliability.

Ordering Information[1,2]

Part Number	Package
MASW-011105-TR0500	500 piece reel
MASW-011105-TR1000	1000 piece reel
MASW-011105-SMB	Sample Board

1. Reference Application Note M513 for reel size information.
2. All sample boards include 2 loose parts.

Functional Schematic



Pin Configuration[3]

Pin #	Pin Name	Function
1, 3-5, 7-9, 11	GND	Ground
2	RF1	RF Port 1
6	RFC	RF Common
10	RF2	RF Port 2
12	V2	Control Voltage
13	N/C	No Connection
14	V1	Control Voltage
15	Paddle[4]	Ground

3. MACOM recommends connecting unused package pins to ground.
4. The exposed pad centered on the package bottom must be connected to RF, DC and thermal ground.

Electrical Specifications: Freq. = 17.7 - 31.0 GHz, T_A = +25°C, V1,2 = 0/+5 V, Z_0 = 50 Ω

Parameter	Test Conditions	Units	Min.	Typ.	Max.
Insertion Loss	—	dB	—	1.6	2.0
Isolation	—	dB	25	30	—
Port Amplitude Imbalance	—	dB	—	0.1	—
Port Phase Imbalance	—	°	—	5	—
Return Loss	RFC RF1, RF2	dB	— —	15 15	— —
Input P0.1dB	@ 24 GHz	dBm	—	24	—
Input IP3	Two Tone, +7 dBm/Tone, 5 MHz Spacing, 24 GHz	dBm	—	43	—
T_{RISE}, T_{FALL}	10% to 90% RF and 90% to10% RF	ns	—	6	—
T_{ON} , T_{OFF}	50% control to 90% RF and 50% control to 10% RF	ns	—	12	—
Settling Time	50% Vctl to 0.1 dB of final value	ns	—	60	—
Control Current (Complementary Logic)	V Low (0 V), V High (5 V)	µA	—	1	2

Absolute Maximum Ratings[5,6]

Parameter	Absolute Maximum
Control Voltage	8.5 V
Input Power	25 dBm
Operating Temperature	-40°C to +85°C
Storage Temperature	-65°C to +150°C

5. Exceeding any one or combination of these limits may cause permanent damage to this device.
6. MACOM does not recommend sustained operation near these survivability limits.

Truth Table[7]

Control Input		Condition of Switch	
V1	V2	RF1	RF2
1	0	On	Off
0	1	Off	On

7. Logic “0”= 0 to 0.2 V, Logic “1” = 5 to 5.2 V.

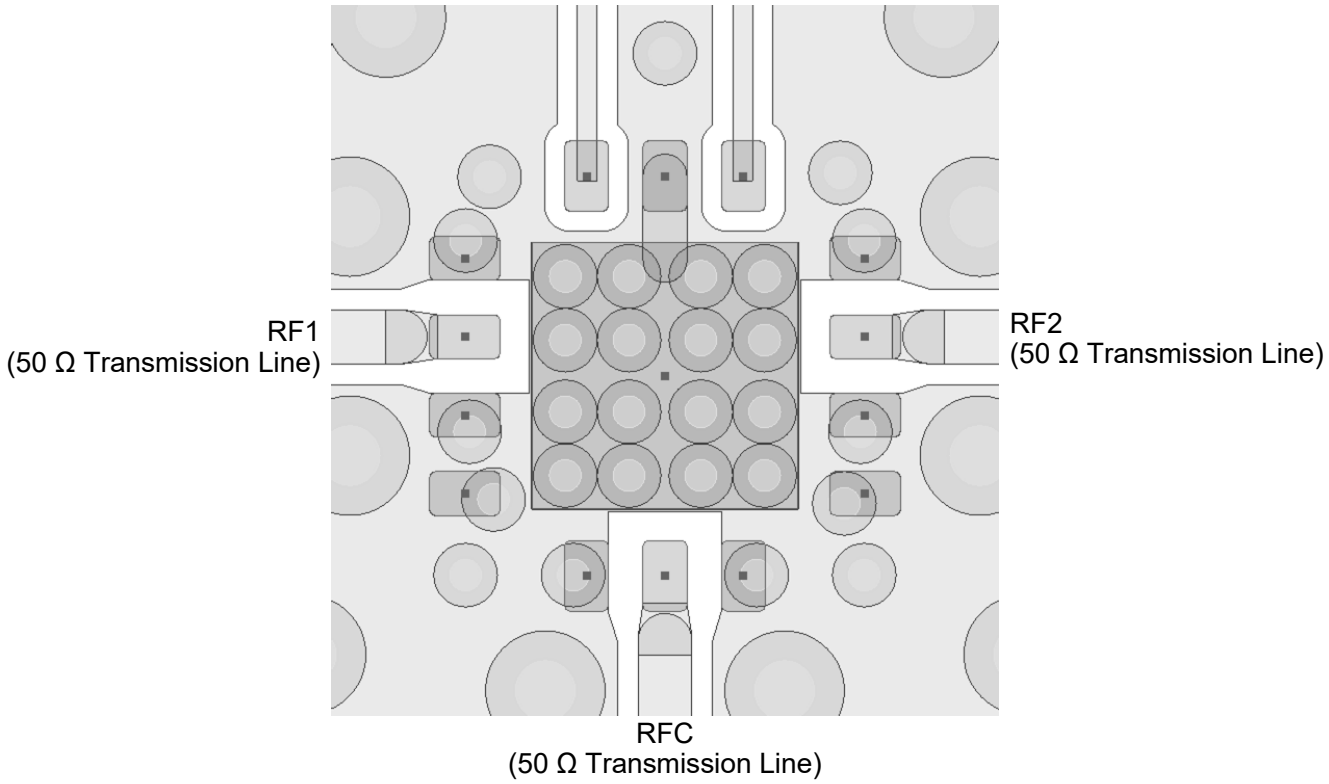
Handling Procedures

Please observe the following precautions to avoid damage:

Static Sensitivity

These electronic devices are sensitive to electrostatic discharge (ESD) and can be damaged by static electricity. Proper ESD control techniques should be used when handling these devices.

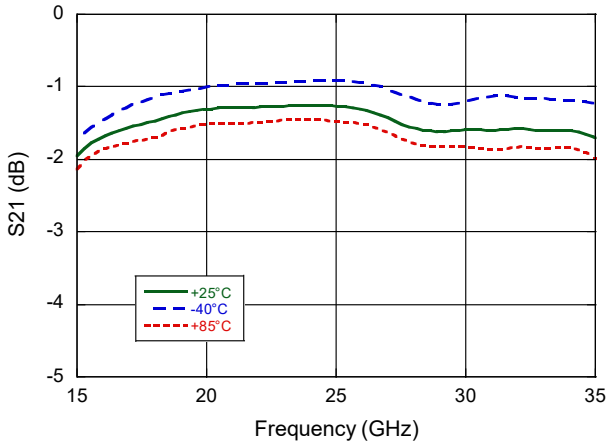
PCB Layout Recommendation



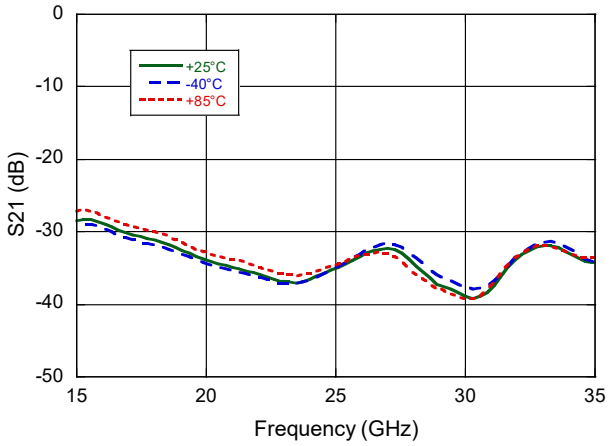
Ground of transmission lines should connect to package paddle in shortest possible way.

Typical Performance Curves

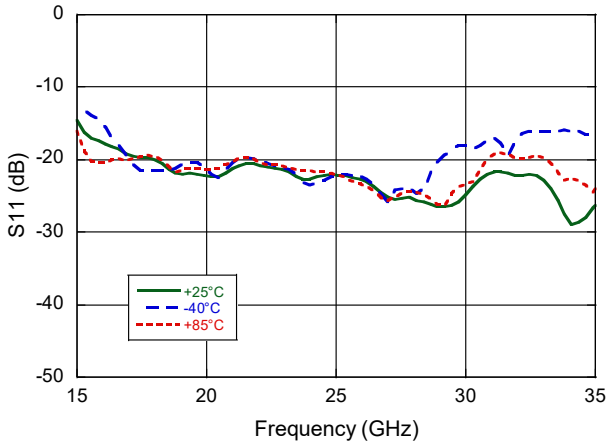
Insertion Loss



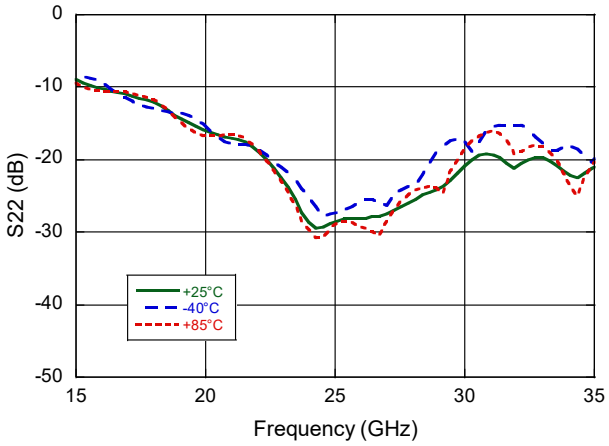
Isolation



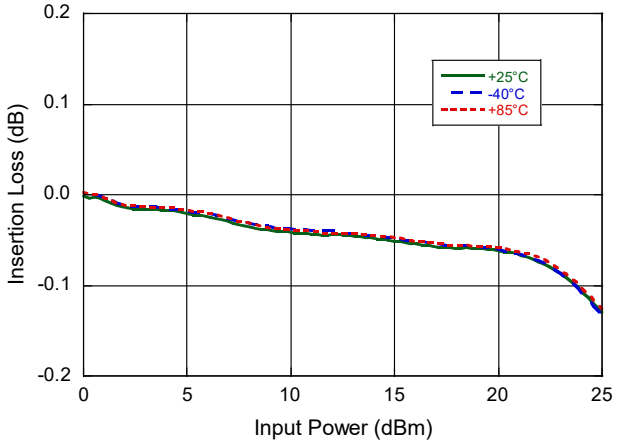
Input Return Loss (RF Common)



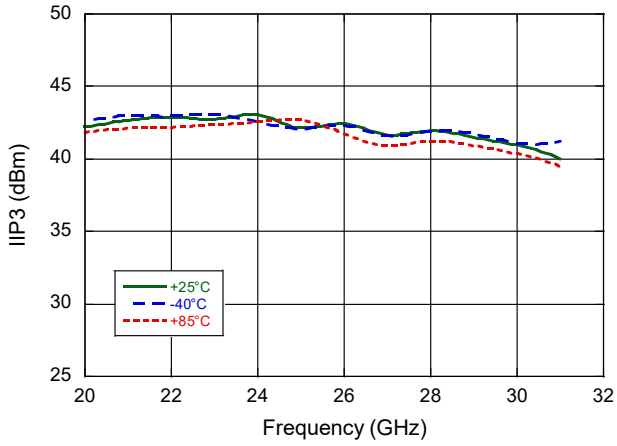
Output Return Loss (On state RF1, RF2)



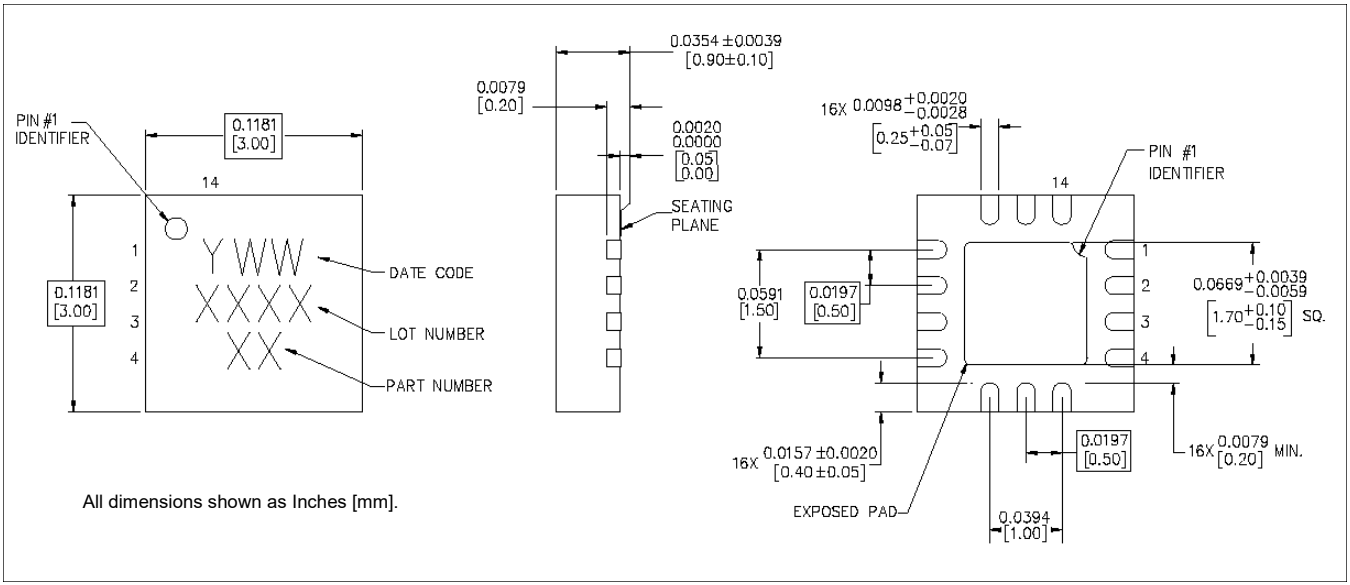
Gain Compression @ 24 GHz



Input IP3



Lead-Free 3 mm 14-Lead PQFN†



† Reference Application Note S2083 for lead-free solder reflow recommendations.
Meets JEDEC moisture sensitivity level 1 requirements.
Plating is NiPdAuAg.